FIG. 1 (PRIOR ART)

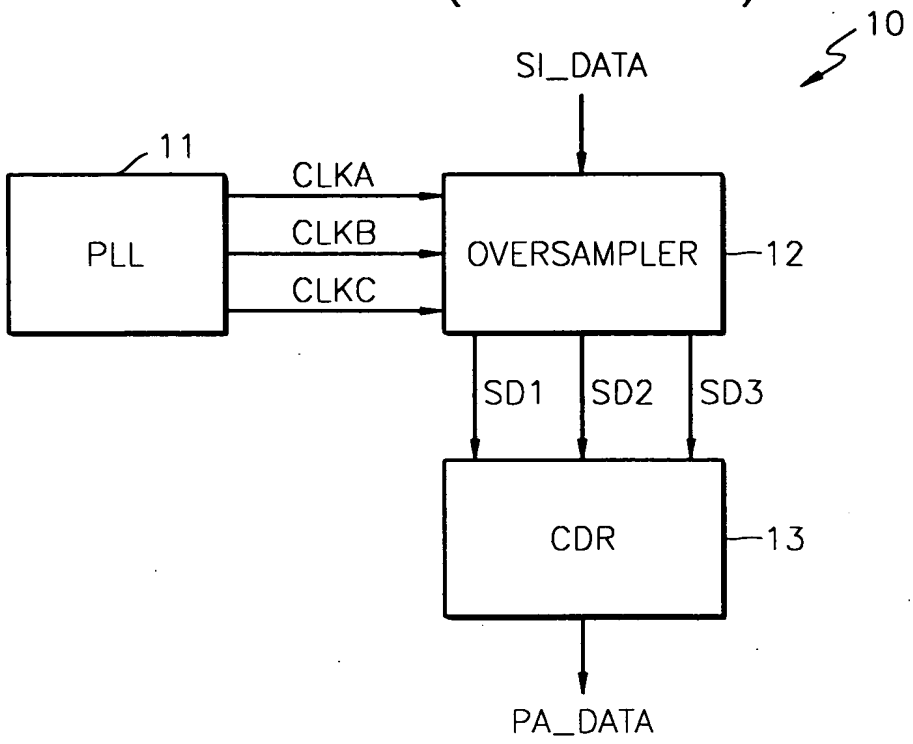


FIG. 2 (PRIOR ART)

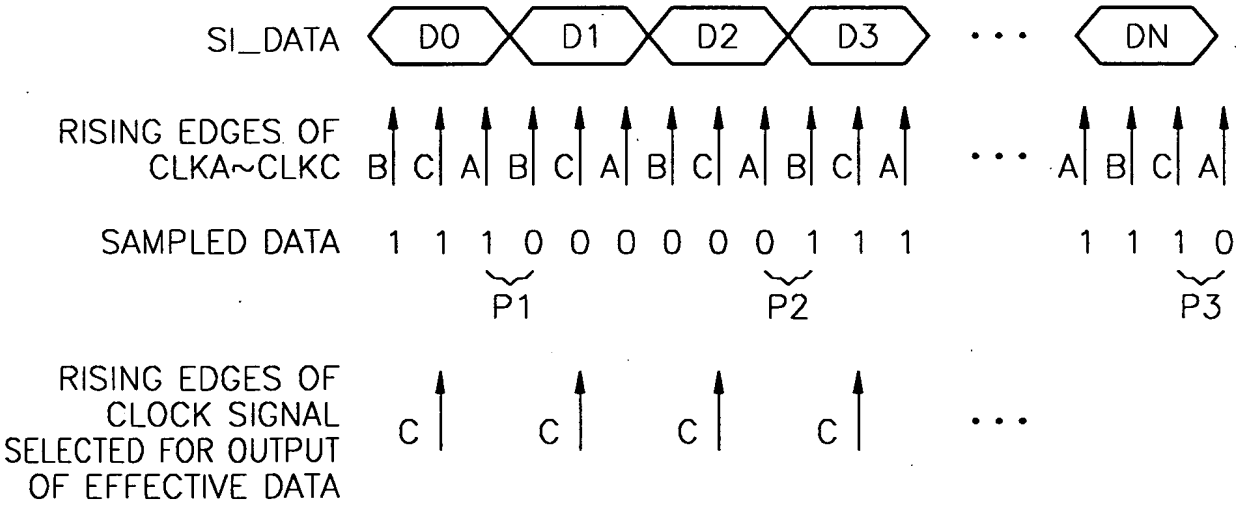


FIG. 3A (PRIOR ART)

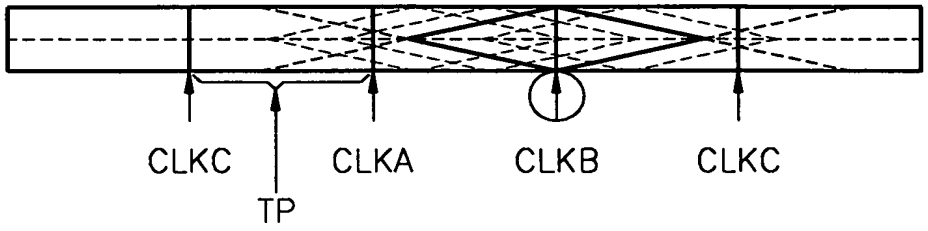


FIG. 3B (PRIOR ART)

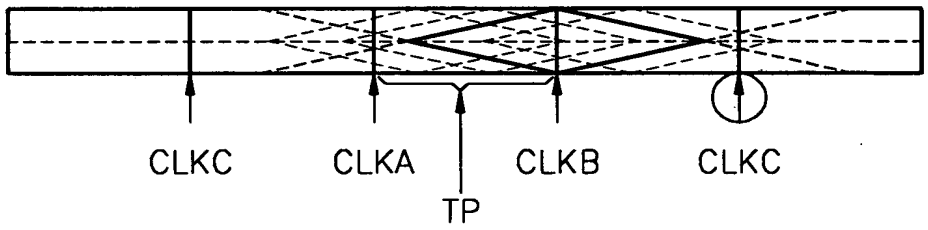


FIG. 3C (PRIOR ART)

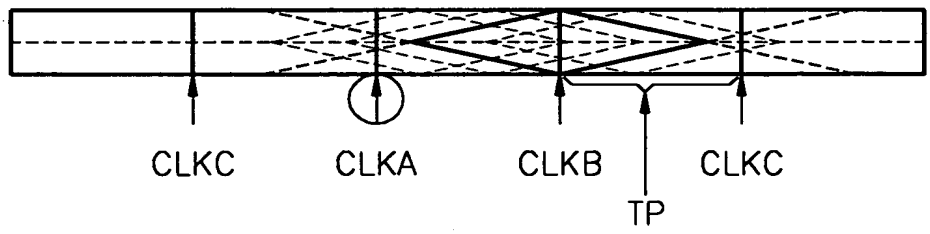


FIG. 4

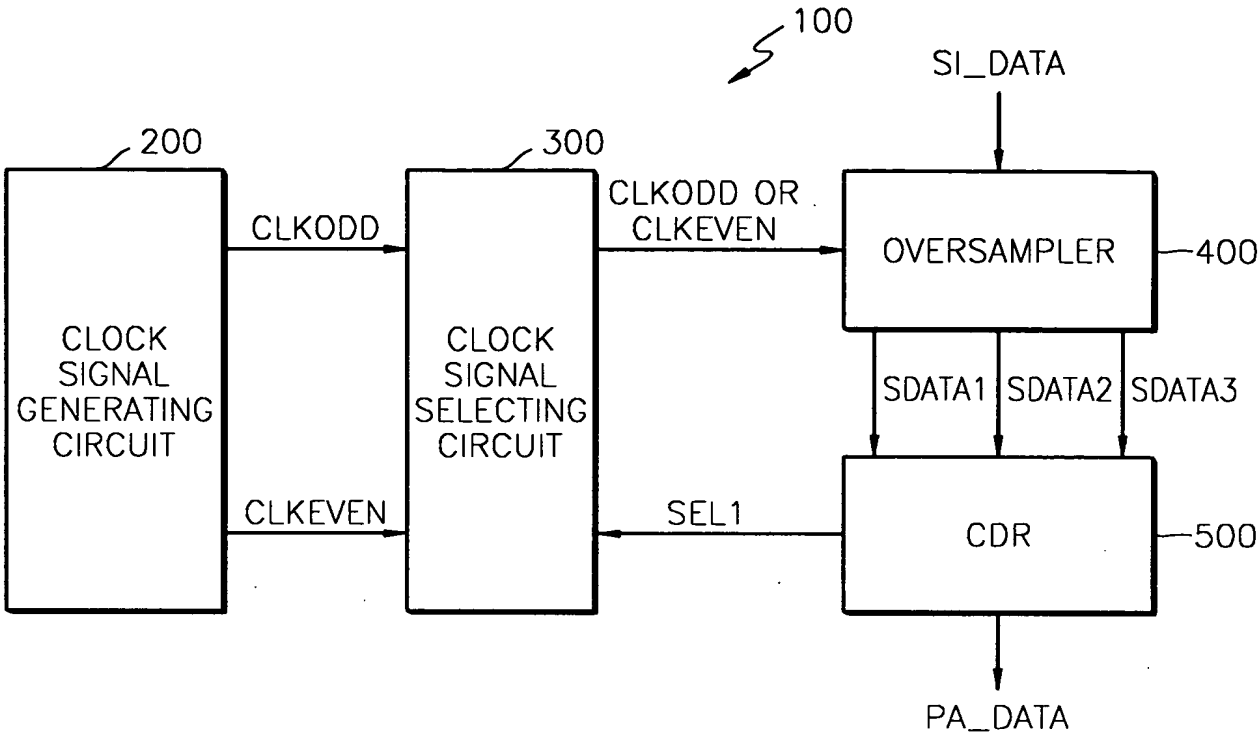

100
SI_DATA
200
300
CLKODD
CLKODD OR
CLKEVEN
OVERSAMPLER
400
CLOCK
SIGNAL
GENERATING
CIRCUIT
CLOCK
SIGNAL
SELECTING
CIRCUIT
SDATA1
SDATA2
SDATA3
CLKEVEN
SEL1
CDR
500
PA_DATA

FIG. 5

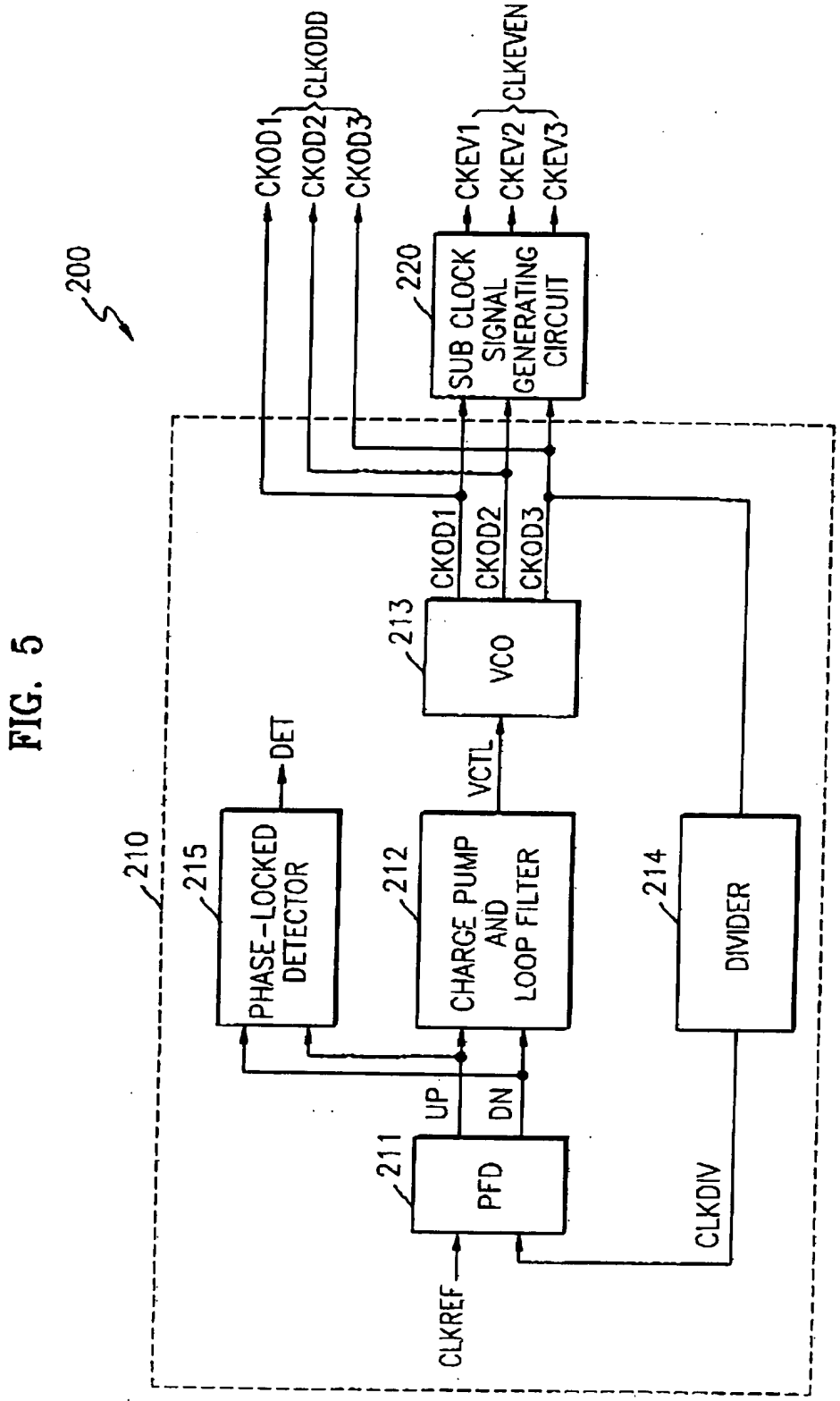

200
210
220
SUB CLOCK SIGNAL GENERATING CIRCUIT
CKOD1
CKOD2
CKOD3
CLKODD
CKEV1
CKEV2
CKEV3
CLKEVEN
213
VCO
VCTL
215
PHASE-LOCKED DETECTOR
DET
212
CHARGE PUMP AND LOOP FILTER
214
DIVIDER
211
PFD
UP
DN
CLKREF
CLKDIV

FIG. 6

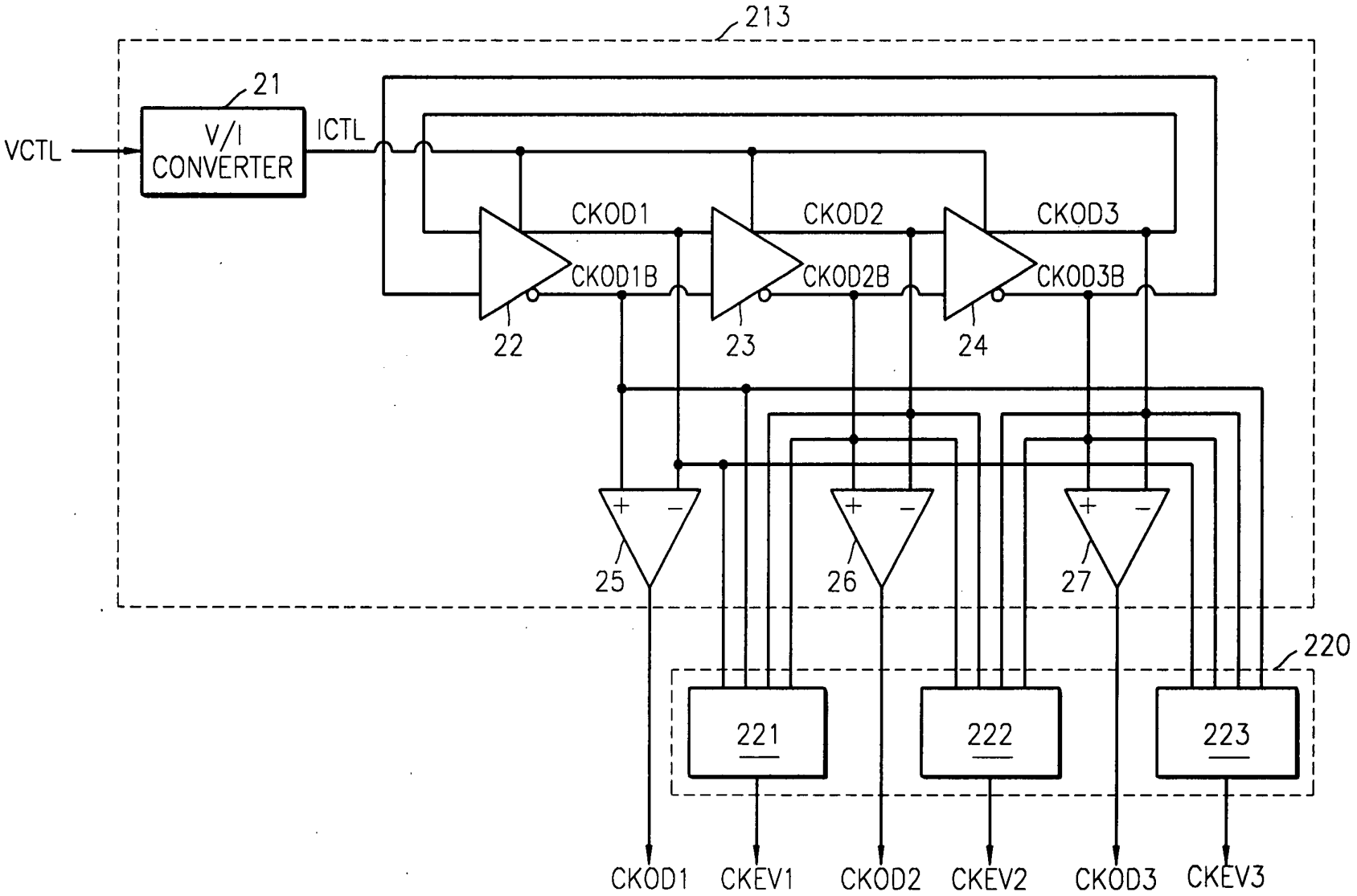

213
21
V/I CONVERTER
VCTL
ICTL
CKOD1
CKOD2
CKOD3
CKOD1B
CKOD2B
CKOD3B
22
23
24
25
26
27
220
221
222
223
CKOD1
CKEV1
CKOD2
CKEV2
CKOD3
CKEV3

FIG. 7

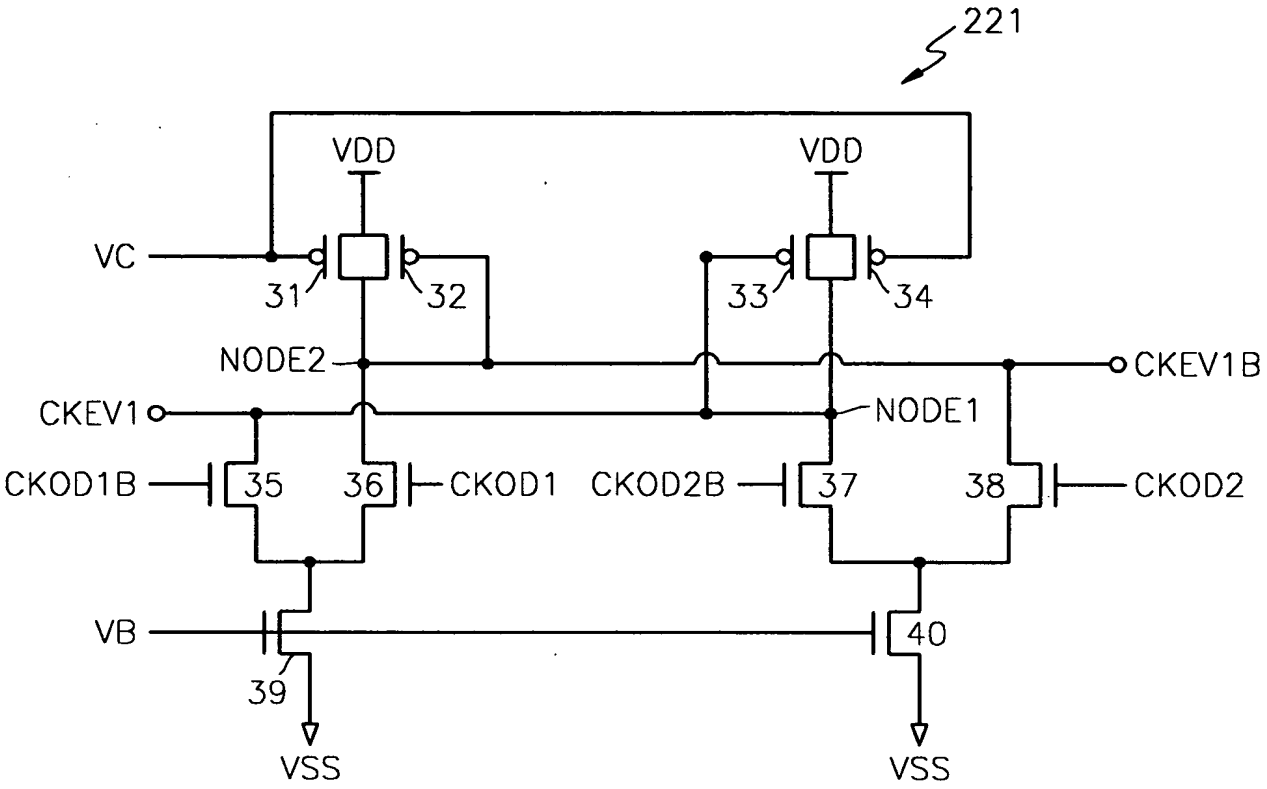

221
VDD
VDD
VC
31
32
33
34
NODE2
CKEV1B
CKEV1
NODE1
CKOD1B
35
36
CKOD1
CKOD2B
37
38
CKOD2
VB
40
39
VSS
VSS

FIG. 8

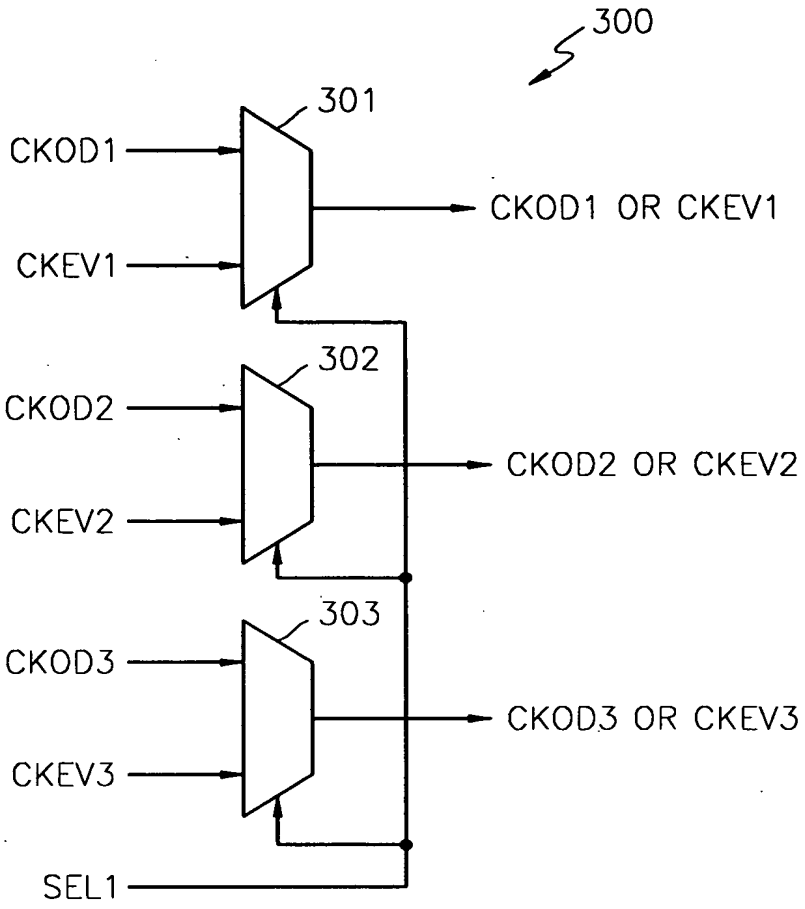

300
301
CKOD1
CKEV1
CKOD1 OR CKEV1
302
CKOD2
CKEV2
CKOD2 OR CKEV2
303
CKOD3
CKEV3
CKOD3 OR CKEV3
SEL1

FIG. 9

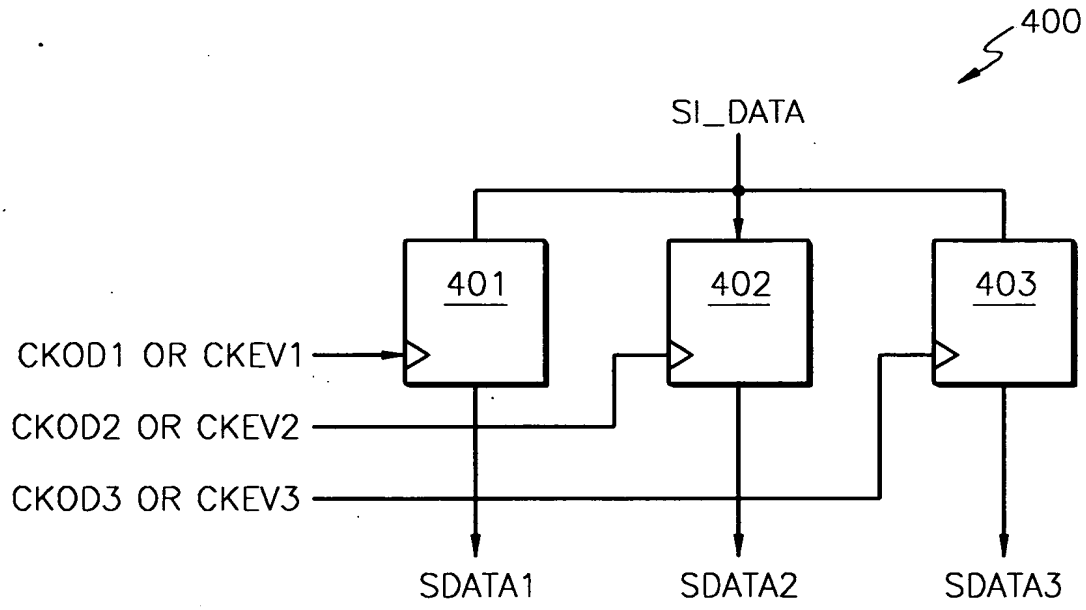

400
SI_DATA
401
402
403
CKOD1 OR CKEV1
CKOD2 OR CKEV2
CKOD3 OR CKEV3
SDATA1
SDATA2
SDATA3

FIG. 10

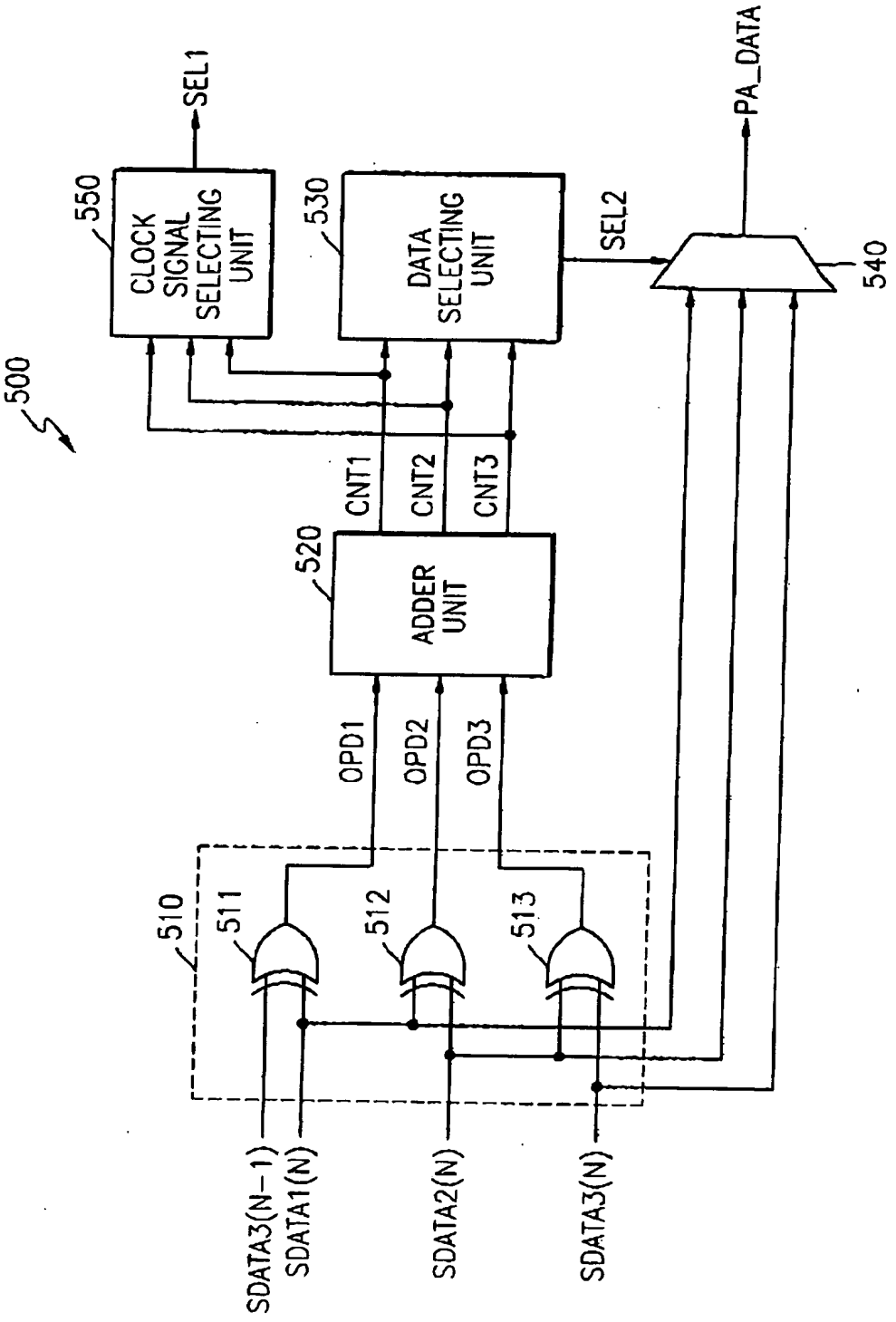

500
CLOCK SIGNAL SELECTING UNIT
550
SEL1
DATA SELECTING UNIT
530
SEL2
PA_DATA
540
CNT1
CNT2
CNT3
ADDER UNIT
520
OPD1
OPD2
OPD3
510
511
512
513
SDATA3(N-1)
SDATA1(N)
SDATA2(N)
SDATA3(N)

FIG. 11A

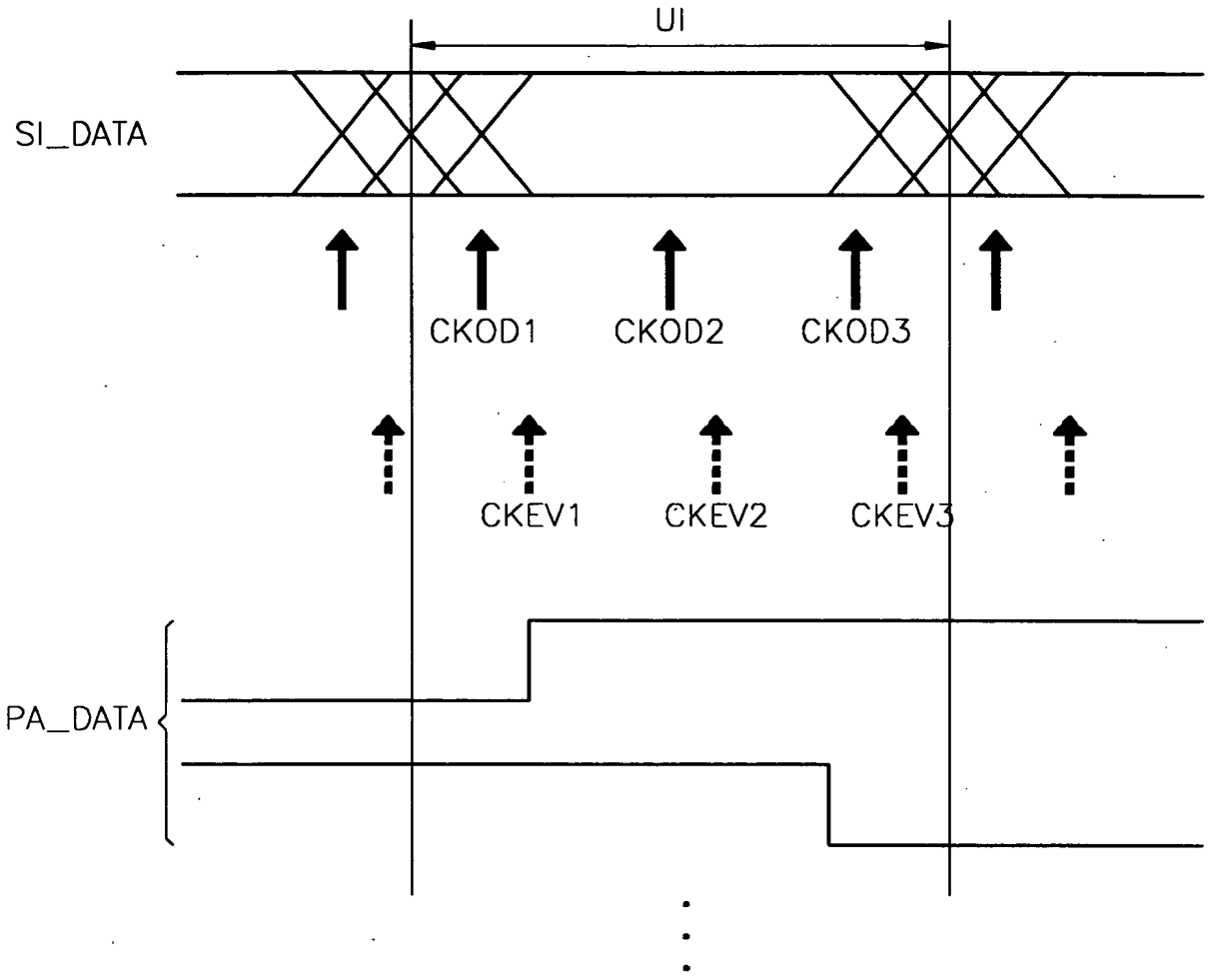


FIG. 11B

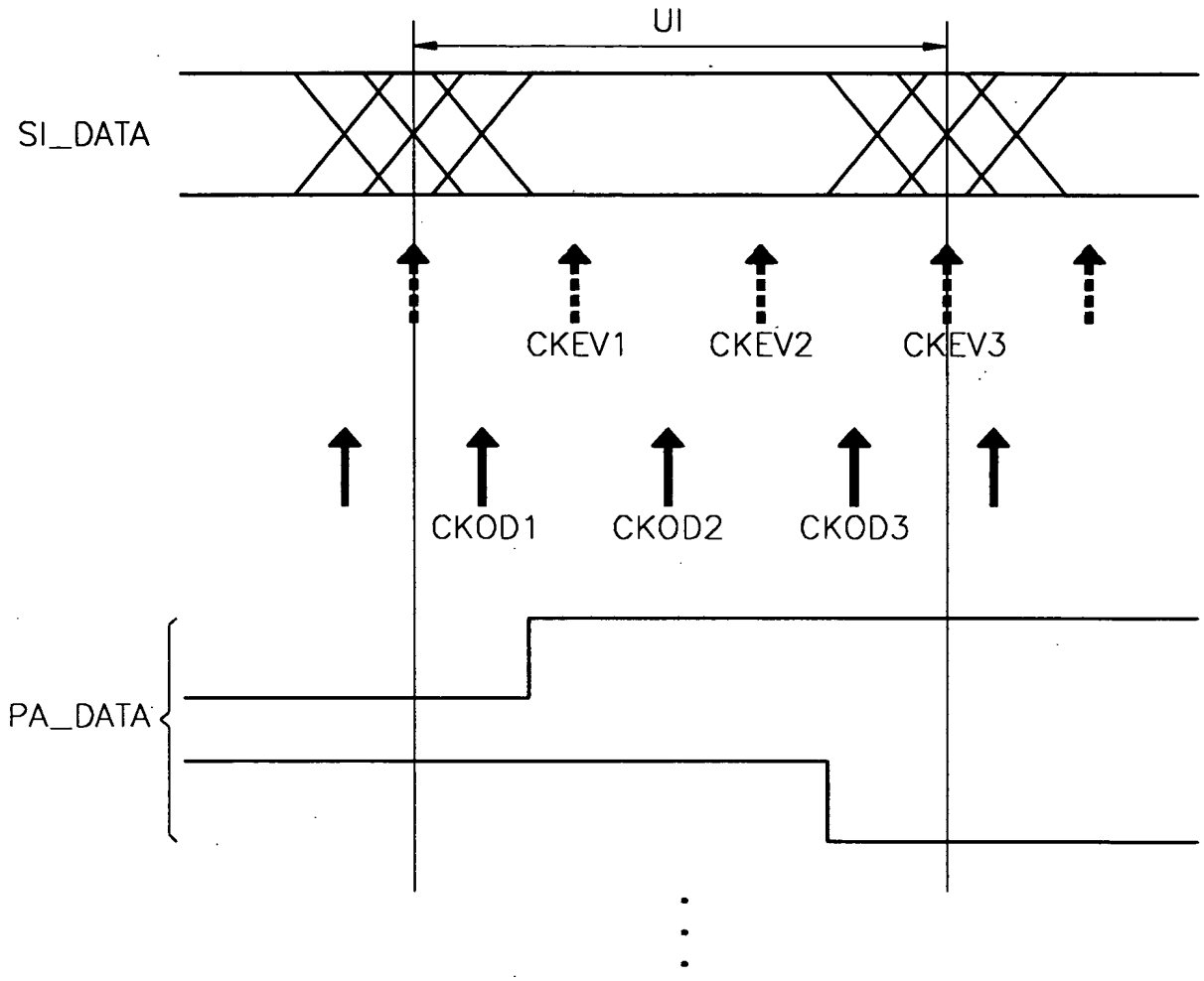


FIG. 12

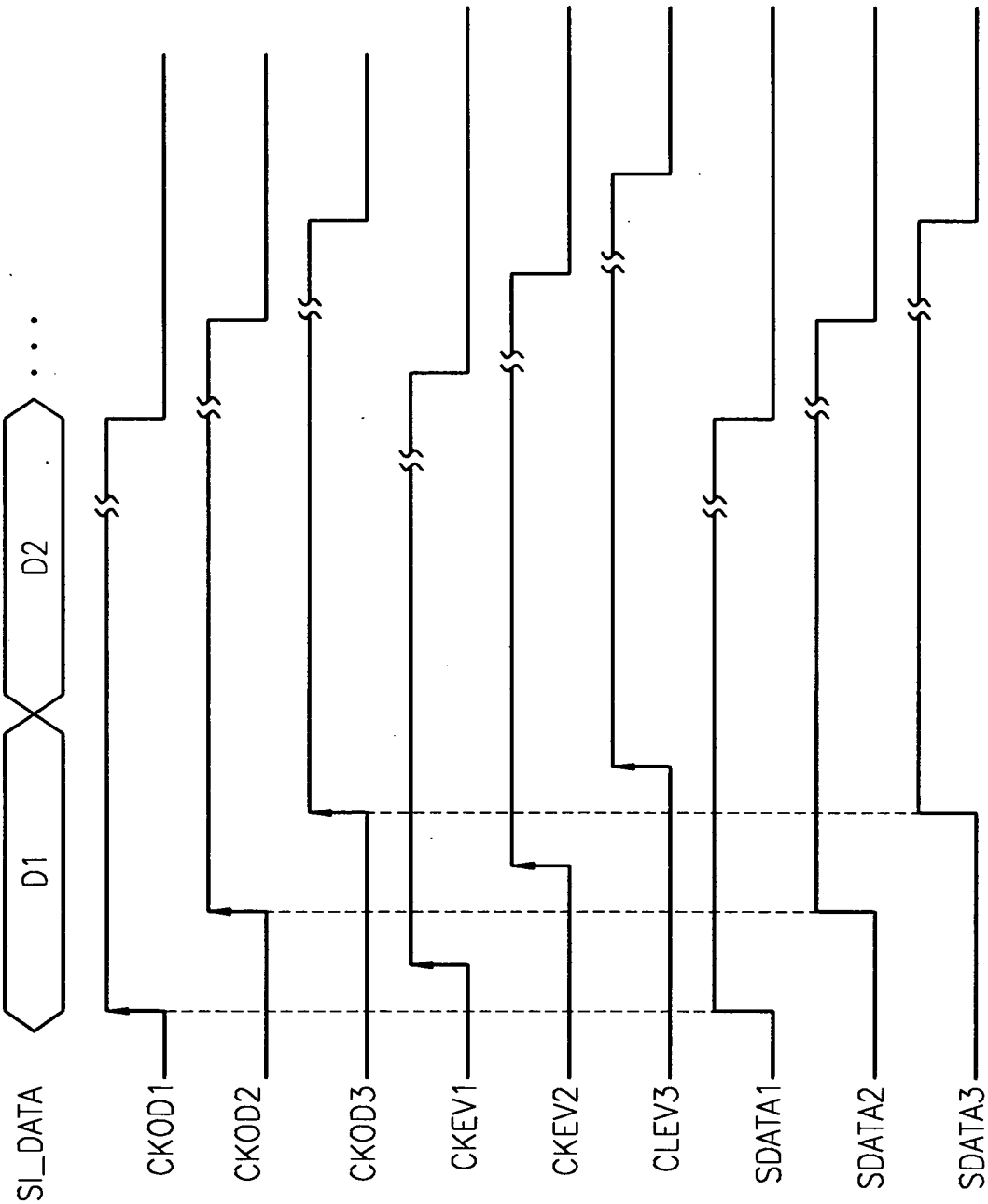
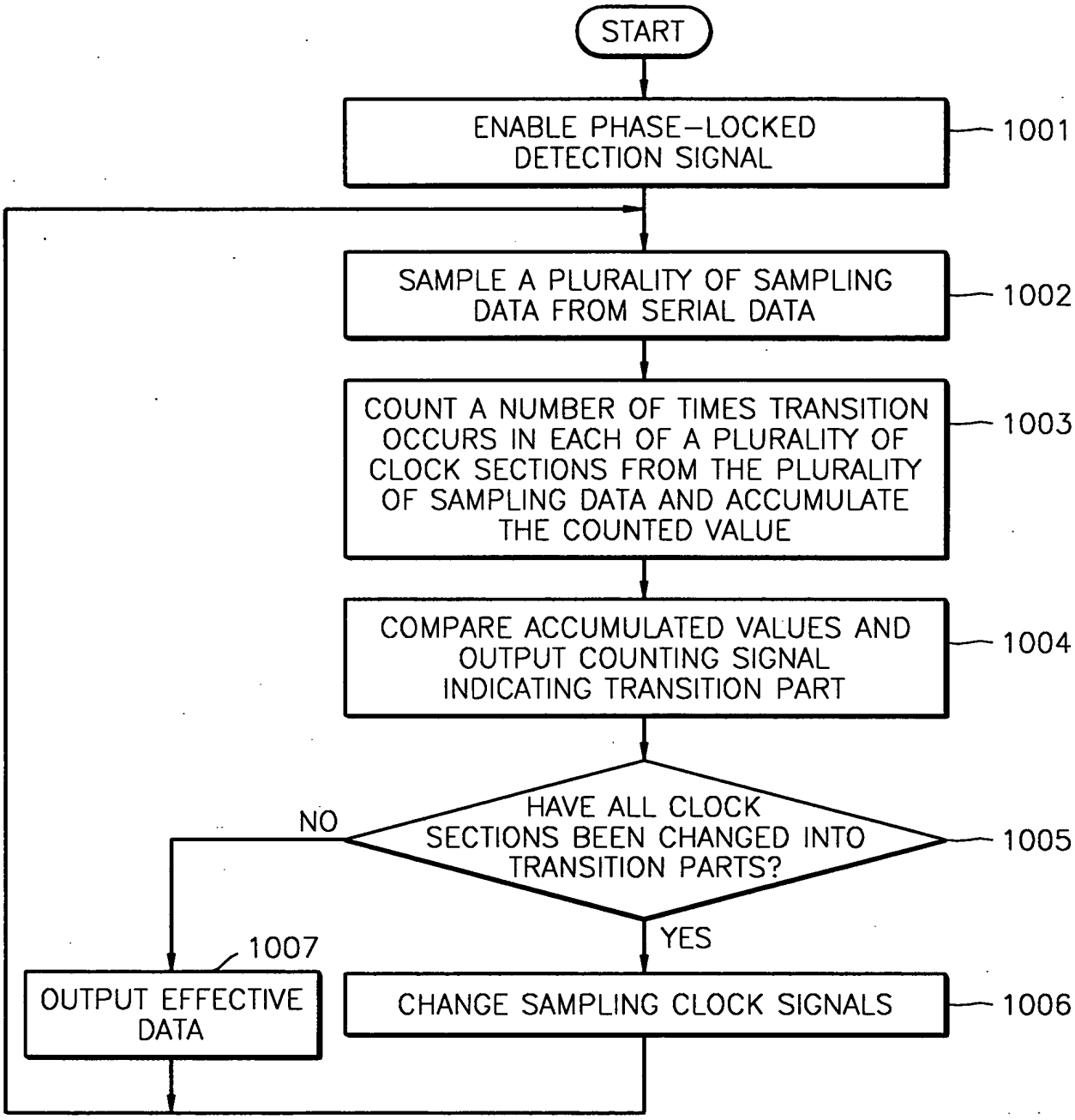

SI_DATA
D1
D2
CKOD1
CKOD2
CKOD3
CKEV1
CKEV2
CLEV3
SDATA1
SDATA2
SDATA3

FIG. 13


START
ENABLE PHASE-LOCKED DETECTION SIGNAL
1001
SAMPLE A PLURALITY OF SAMPLING DATA FROM SERIAL DATA
1002
COUNT A NUMBER OF TIMES TRANSITION OCCURS IN EACH OF A PLURALITY OF CLOCK SECTIONS FROM THE PLURALITY OF SAMPLING DATA AND ACCUMULATE THE COUNTED VALUE
1003
COMPARE ACCUMULATED VALUES AND OUTPUT COUNTING SIGNAL INDICATING TRANSITION PART
1004
HAVE ALL CLOCK SECTIONS BEEN CHANGED INTO TRANSITION PARTS?
1005
NO
YES
1007
OUTPUT EFFECTIVE DATA
CHANGE SAMPLING CLOCK SIGNALS
1006